REMARKS

This Amendment is filed in response to the final Office Action dated May 29, 2008. For the following reasons this amendment should be entered, the application allowed, and the case passed to issue. No new matter or considerations are introduced by this amendment. Support for the amendment to claims 5 and 15 is found in originally filed claim 5 and the specification at page 2, lines 18 to 20. The limitations added to claims 5 and 15 have previously been considered in claims 1 and 5.

Claims 5-8 and 13-15 are pending in this application. Claims 13 and 14 have been withdrawn pursuant to a restriction requirement. Claims 1-8 and 15 are rejected. Claims 5 and 15 have been amended in this response. Claims 1-4 have been canceled in this response. Claims 9-12 were previously canceled.

Information Disclosure Statement

The Examiner requested under 37 C.F.R. § 1.105 that Applicants provide a list of the 15 most pertinent and relevant references, a concise explanation of relevance or English translation for each foreign reference and non-patent literature reference, and a concise explanation of relevance for each U.S. reference. The Examiner cited section 609.09(a)(III) of the MPEP as allegedly supporting this request.

The Examiner's request is traversed. Neither 37 C.F.R. § 1.105 nor the MPEP require a list of the 15 most pertinent and relevant references and a concise explanation of the relevance for each reference cited. Furthermore, there is no section 609.09(a)(III) in the MPEP. English abstracts have been provided for the foreign patents and the relevancy of the English language references should be self-explanatory. Thus, the Examiner's request is clearly unreasonable and not supported by either the rules or the MPEP.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takemura et al. `232 in view of Takemura et al. (US 6,224,688) (Takemura et al. `688). The Examiner considered a transmission component as a component capable of transmitting a force. The Examiner acknowledged that Takemura et al. `232 did not disclose a grain size number exceeding 10. The Examiner relied on the Takemura et al. `688 teaching of a rolling bearing with a nitriding layer have a grain size of 11 or above. The Examiner considered the fracture stress to be inherent.

Claims 1-8 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takemura et al. (`232) in view of Takemura et al. (`688) and further in view of Maeda et al. (US 6,423,158). The Examiner recognized that Takemura et al. (`232) and (`688) do not disclose a tapered rolling bearing having an inner ring, an outer ring, and a tapered roller. The Examiner relied on the teachings of Maeda et al. to conclude that it would have been obvious to modify the bearing of Takemura et al. `688 by using a tapered roller to support both radial and thrust loads.

The asserted combination of references do not suggest a transmission component of a transmission capable of changing a rotational speed of an output shaft relative to a rotational speed of an input shaft by means of mesh of toothed wheels or a tapered roller bearing having a nitriding layer formed by a carbonitriding process at a surface layer, a fracture stress value of at least 2650 MPa, an austenite grain with a grain size number of 11 or greater, and a non-diffusible hydrogen content of at most 0.5 ppm, as required by claims 5 and 15, respectively.

The secondary quenching temperatures of Takemura et al. `232 would not provide the claimed grain size number. As shown in Table 1, secondary quenching at the temperatures disclosed by Takemura et al. `232 produce larger grain sizes. Further, it would not have been

obvious to combine Takemura et al. `232 and Takemura et al. `688 to obtain the claimed component because Takemura `232 teach carbonitriding and Takemura et al. `688 teach away from carbonitriding. Furthermore, even if Takemura et al. `232 and Takemura et al. `688 were combined the claimed component would not result. Maeda et al. do not cure the deficiencies of Takemura et al. `232 and `688.

The Examiner's assertion that the non-diffusible hydrogen content in the cited references would have been zero because it is not disclosed in the cited references is traversed. As shown in Table 1, conventional quenching techniques and conventional carbonitrided methods provide components with non-diffusible hydrogen. Thus, the Examiner does not have a basis for asserting that because a reference is silent about non-diffusible hydrogen it does not contain non-diffusible hydrogen.

Further, it would not have been obvious to combine Takemura et al. `232 and Takemura et al. `688, as asserted by the Examiner, to obtain the claimed component because Takemura `232 teach carbonitriding and Takemura et al. `688 teach away from carbonitriding. Takemura et al. teach that carbonitriding "costs a great deal" and "cannot be expected to obtain fine crystal grains" (column 2, lines 52 to 56). Further, even if Takemura et al. `232 and Takemura et al. `688 were combined the claimed component would not result, as the secondary quenching temperatures of Takemura et al. `232 would produce grain sizes that are too large. Maeda et al. do not cure the deficiencies of Takemura et al. `232 and `688, as Maeda et al. do not suggest the transmission component having a grain size number of 11 or greater and a non-diffusible hydrogen content of at most 0.5 ppm.

In the present invention, it has been discovered that the thermal treatment, as shown in Figs. 3 and 4, provides a steel that has the following three characteristics: (1) a content of non-

diffusible hydrogen of at most 0.5 ppm, (2) a fracture stress value of at least 2,650 MPa, and (3) an austenite grain with a grain size of 11 or greater. The cited prior art references do not suggest this unexpected combination of properties. Furthermore, the present inventors have found that such steel applied to a transmission configured with meshing gears allows the transmission to have improved anti-crack strength, dimensional stability, and fatigue life.

None of the cited references suggest the thermal treatment method of carbonitriding steel at a temperature exceeding the A_1 transformation point to perform a carbonitriding process, then cooling the steel to a range of temperature less than the A_1 transformation point, and then reheating the steel to a range of temperature of at least the A_1 transformation point and less than the temperature of the carbonitriding process for quenching, as shown in Figs. 3 and 4. Though Takemura et al. `232 broadly disclose a secondary heating temperature range of 830 °C to 870 °C, Takemura et al. `232 does not disclose any specific examples or suggest a secondary heat treatment that is heated to a maximum temperature of 830 °C. Thus, Takemura et al. `232 do not disclose or suggest the claimed quenching temperature range. Quenching at the temperature range of Takemura et al. `232 would increase the crystal grain size, as indicated by Samples E and F in Table 1 (page 18) of the present specification.

The present invention is further distinguishable over the cited prior art because Takemura et al. disclose a toroidal-type continuously variable transmission, not a transmission with meshing gears, as required by claim 5.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313,

1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Takemura et al. (`232), Takemura et al. (`688), and Maeda et al. to modify the transmission component of Takemura et al. (`232) to have a nitriding layer formed by a carbonitriding process at a surface layer, a fracture stress value of at least 2650 MPa, an austenite grain with a grain size number of 11 or greater, and a non-diffusible hydrogen content of at most 0.5 ppm, as required by claim 5; and a tapered roller bearing having a nitriding layer formed by a carbonitriding process, a fracture stress value of at least 2650 MPa, an austenite grain with a grain size number of 11 or greater, and a non-diffusible hydrogen content of at most 0.5 ppm, as required by claim 15.

The only teaching of the claimed transmission components is found in Applicant's disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Examiner's unsupported, conclusory assertions are not sufficient to establish a prima facie case of obviousness.

In view of the above amendments and remarks, Applicants submit that this amendment should be entered, the application allowed, and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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